

# Factoring

## 1. Common Factor

- |                       |                            |                      |
|-----------------------|----------------------------|----------------------|
| a. $2x + 4$           | i. $24x - 30$              | q. $4r^2 - 8r$       |
| b. $-3x - 18$         | j. $-7x - 21$              | r. $-15x^2 - 25x$    |
| c. $18x^2 - 6x + 6$   | k. $24x^3 - 15x^2 - 20x$   | s. $-ax + ay - 2a$   |
| d. $60x^2 - 25x + 15$ | l. $21x^4 - 28x^3 - 35x^2$ | t. $6a + 9b - 3c$    |
| e. $10x^2 - 4x$       | m. $3x + 3y$               | u. $3a^2 + 6a$       |
| f. $-16xy - 4x$       | n. $-5a - 5b$              | v. $36a^4 - 9b^4$    |
| g. $-2x + 6y$         | o. $4m + 6n$               | w. $x^2y^3z - 2xy^2$ |
| h. $-mx + my$         | p. $5 - 10b$               | x. $x^2 - x$         |

## 2. Factor using the difference of squares, remember to check for a common factor first.

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|-----------------|-----------------|-------------------------|
| a. $x^2 - 1$    | f. $x^2 - 9$    | j. $2x^2 - 8$           |
| b. $81x^2 - 16$ | g. $m^4 - 16$   | k. $-1 + 9x^2$          |
| c. $-9m^2 + 49$ | h. $x^3 - xy^2$ | l. $x^8 - 1$            |
| d. $-16 + 9y^2$ | i. $-x^2 + 16$  | m. $\frac{x^2}{25} - 1$ |
| e. $-(1 - a^4)$ |                 |                         |

## 3. Factor using sum and product, remember to check for a common factor first.

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|----------------------|---------------------|-----------------------|
| a. $x^2 + 7x + 12$   | g. $x^2 - 5x - 24$  | m. $a^2 + 10a + 21$   |
| b. $x^2 - 1x - 12$   | h. $x^2 + 3x - 88$  | n. $y^2 - 5y - 14$    |
| c. $x^2 + 8x + 12$   | i. $m^2 - 9m - 112$ | o. $x^2 + 13x - 30$   |
| d. $2x^2 + 6x - 8$   | j. $a^2 - 5a - 36$  | p. $4x^2 + 28x + 24$  |
| e. $-x^2 + 7x - 12$  | k. $4y^2 + 8y - 60$ | q. $2x^2 - 2x - 24$   |
| f. $3a^2 - 36a - 39$ | l. $x^2 - 13x + 30$ | r. $-a^2 - 2ab - b^2$ |

## 4. Factor using decomposition, remember to check for a common factor first.

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|----------------------|-----------------------|---------------------------|
| a. $16x^2 - 8x - 1$  | e. $3x^2 - 18x + 15$  | i. $3a^2 - a - 4$         |
| b. $2x^2 + 3x - 20$  | f. $9x^2 + 12x + 4$   | j. $-15 - y + 6y^2$       |
| c. $2x^2 + 13x + 6$  | g. $6x^2 - 33x + 36$  | k. $8x^2 - 22xy - 21y^2$  |
| d. $4x^2 - 27x + 35$ | h. $14x^2 - 62x - 40$ | l. $15a^2 - 25ab - 10b^2$ |

## 5. Factor.

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|-----------------------|-------------------------|-----------------------|
| a. $36 - 16x^2$       | g. $3x^2 - 18x^2 - 216$ | m. $x^2 - 10x + 25$   |
| b. $4x^2 + 10x - 24$  | h. $12 - 26x + 10x^2$   | n. $-x^2 - 7x - 12$   |
| c. $4x^2 + 12x + 9$   | i. $x^2 + 3x + 2$       | o. $3x^2 + 9x - 12$   |
| d. $4x^2 + 2x - 6$    | j. $a^4 - 5a^2 - 36$    | p. $5x^2 - 10x + 15$  |
| e. $x^4 - 16$         | k. $3x^2 + 9x + 6$      | q. $x^4 - 64$         |
| f. $x^4 - 13x^2 + 36$ | l. $8x^2 - 98$          | r. $m^4 - 9m^2 - 112$ |

## 6. Fully factor.

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|---------------------|-------------------------|-------------------------|
| a. $16x^2 - 25$     | h. $h^4 - 256$          | o. $m^2b^2 - 10mb + 25$ |
| b. $36y^2 - 121$    | i. $4x^8 - 64y^8$       | p. $3x^2 - 6x + 3$      |
| c. $25a^2b^2 - 49$  | j. $(5j - 3)^2 - 49$    | q. $4a^2 - 80a + 400$   |
| d. $81m^4 - 625y^6$ | k. $9m^2 - (2n + 5)^2$  | r. $x^3 - 14x^2 + 49x$  |
| e. $8e^2 - 50$      | l. $(3a + 7)^2 - 121$   | s. $12x^2 + 36x + 27$   |
| f. $48x^2 - 27y^2$  | m. $x^2 - 12x + 36$     | t. $49 - 42a + 9a^2$    |
| g. $20m^4n^4 - 180$ | n. $x^2 + 18xy + 81y^2$ | u. $32a^3 - 16a^2 + 2a$ |

7. Fully Factor

a.  $-30x^4y^6 - 35x^3y^5 - 55x^7y^3$

b.  $16x^3y^3 + 24x^5y^7 - 32x^2y^4$

c.  $12x(3y + 8) + 17y(3y + 8)$

d.  $4a^2(2b + d) - 5c(2b + d)$

e.  $2bm - 4bn + am - 2an$

f.  $12ab - 9ac - 28bd + 21cd$

g.  $-8ad + 12bc - 24bd + 4ac$

h.  $-5 - 10x + x^2 + 2x^3$

8. Factor each of the following

a.  $2x^3 - 4x$

b.  $x^3 - 5x^2 + 2x - 10$

c.  $x^4 + 2x^3 - 3x^2 - 6x$

d.  $x^3 - 6x^2 + 11x - 5$

e.  $3x^3 + 4x^2 - 5x - 2$

f.  $2x^3 - 3x^2 - 4x + 4$

g.  $x^4 - 4x^2 + 3$

h.  $x^4 + 4x^3 - 3x^2$

i.  $x^3 + 5x^2 - 18x - 18$